October 13, 2005

Jackalyne Pfannenstiel, Vice Chair
2008 Title 24
California Energy Commission
1516 9th Street, MS- 25
Sacramento, CA 95814-5504

Dear Ms. Pfannenstiel:

Please find accompanying this letter the Measure Information Template form for adding high-rise residential and hotel/motel structure to the guidelines for Cool Roof systems in the 2008 Title 24. The base work done for Cool Roof design done for the 2001 and 2005 standards will support this recommendation. W e stand ready to answer any questions and supply additional information that may be needed by the committee to achieve approval for the recommendation.

Best regards,

Richard J. Gillenwater

Richard J. Gillenwater

CC: Elaine Hebert Bill Pennington

Measure Information Template – Expanding the use of Cool Roofs to Low-Slope Roofs on High-Rise Residential, and Hotel/Motel Occupancies

2008 California Building Energy Efficiency Standards

Richard J. Gillenwater
October 14, 2005

CONTENTS

Overview

Description	Expanding the use of Cool Roof design to low-sloped roofs on high-rise residential and hotel/motel occupancies to take advantage of the energy savings offered by this type roofing system. These structures have individual units under the roof structure that generally are conditioned. The Cool Roof will help to reduce the energy required to do the conditioning.

<table>
<tr><td>Type of Change</td><td>Mandatory Measure N/A
Prescriptive Requirement In Subchapter 5, Section 143(a)1A, the minor wording adjustment would be:

A. For nonresidential, high-rise residential, and hotel/motel occupancy buildings with low-sloped roofs, meet the requirements of either 118 (i) 1 or 118 (i) 2 and for liquid applied roof coatings, Section 118 (i) 3; and

Compliance Option The Compliance Option for high-rise residential, and hotel/motel occupancy building would no longer exist for these building and now would have to comply with Subchapter 5 and 6.

Modeling Follows existing modeling for Cool Roofs.

Other N/A

This proposed change does not modify or expand the scope of the Standards, only extends the reach of the standard to several building types that were not include under Cool Roof guidelines in the 2005 standard.</td></tr>
<tr><td>Energy Benefits</td><td>This increases the number of building types to receive the benefits of the Cool Roof. These type structures have individual units directly under the roof that have condition space and would benefit from the reduced energy demand as well as lower the cost to the owner.</td></tr>
<tr><td>Non-Energy Benefits</td><td>Reduce heat island affect.</td></tr>
<tr><td>Environmental Impact</td><td>Deduced heat island affect. Reduced VOC’s release to the atmosphere.</td></tr>
<tr><td>Technology Measures</td><td>Measure Availability and Cost The availability and cost have been well documented in the original work for Cool Roofs for the 2001 and 2005 Title 24 standards.
Useful Life, Persistence and Maintenance Cool metal and single ply roof systems offer full system warranties up to 20 years with some offering reflectivity warranties. Besides the energy savings benefit, the water tight performance over the life of the roof except that of the presently typical BUR used in these applications.

<table>
<tr><th>System</th><th>Cost/sqft</th><th>Years service</th><th>L-CC/sqft/yr</th></tr>
<tr><td>BUR</td><td>$1.00</td><td>10</td><td>$0.100</td></tr>
<tr><td>Single Ply</td><td>$1.70</td><td>20</td><td>$0.085</td></tr>
<tr><td>Metal</td><td>$4.50</td><td>20</td><td>$0.225</td></tr>
</table>
</td></tr>
<tr><td>Performance Verification</td><td>The Performance Verification would be as presently outlined in the 2005 Title 24 which requires the roof membrane to be tested for reflectivity and emissivity per CRRC-1 test method, listed in the CRRC Product Directory, and have a reflectivity and emissivity that meet or exceed the requirements spelled out in Title 24.</td></tr>
</table>

Cost Effectiveness	The cost effectiveness of expanding Cool Roof applications is based on the work originally done to justify the use of Cool Roofs in the 2001 Title 24 and making them mandatory in a number of case in the present 2005 standard. Applying Cool Roofs to high-rise residential structures helps to reduce energy consumption in the top units of the buildings at the same rate that would be applied to a normal single story structure. This applies to hotel/motel buildings as well.
Analysis Tools	Standard Cool Roof procedures.
Relationship to Other Measures	N/A

Methodology

- Follow the present Cool Roof procedures and requirements with high-rise residential and hotel, motel structures included.

Analysis and Results

The information that was built for the Cool Roof applications applies to this recommendations.

Recommendations

This specific recommendation is to add high-rise residential and hotel/motel buildings to the list of structures that are to be under the Cool Roof guidelines. The change would be worded as follows:

> For nonresidential, high-rise residential, and hotel/motel occupancy buildings with low-sloped roofs, meet the requirements of either 118 (i) 1 or 118 (i) 2 and for liquid applied roof coatings, Section 118 (i) 3; and

Material for Compliance Manuals

Based on previous work done for Cool Roofs.

Bibliography and Other Research

Appendices: None